Amendments to the Specification

Please amend the paragraph beginning on page 2, line 26, as follows:

Depending upon the type of microelectronic devices being fabricated on the substrate, lithographic pattern exposures can be performed using several types of microlithography apparatus rather than only one type. For example, some layers can be exposed using a CPB microlithography ~~apparatus~~ apparatus, and other layers can be exposed using an optical (deep ultraviolet) microlithography apparatus. The reason for this flexibility is that certain layers may have smaller minimum linewidths than other layers, and it is desirable from the standpoint of throughput and other concerns to utilize, for a particular layer, the most efficient lithographic exposure method that also produces the desired linewidth resolution. Hence, it is desirable that the alignment marks formed on the substrate be usable for obtaining high-accuracy position detection by optical means as well as by CPB means.

Please amend the paragraph beginning on page 4, line 22, as follows:

According to a first aspect of the invention, alignment-mark patterns are provided that are defined on a stencil reticle used in charged-particle-beam microlithography. The alignment-mark patterns are configured to be lithographically transferred by a charged particle beam from the stencil reticle to a sensitized substrate so as to imprint on the substrate a corresponding alignment mark detectable using an optical-based alignment-detection device. An embodiment of such an alignment-mark pattern comprises pattern elements defined as respective apertures in the stencil reticle. Each of the pattern elements on the reticle is split into respective pattern-element portions that are separated by respective girders formed from a membrane of the stencil reticle. Splitting of the pattern elements and interposing girders between adjacent pattern-element portions ~~avoids~~ avoid forming membrane islands in the reticle and ~~prevents~~ prevent stress-based deformation of the pattern elements in the reticle. Such an alignment-mark pattern, when projected onto the surface of a suitable substrate, yields a corresponding alignment mark allowing substrate-position (alignment) detection to be performed with high accuracy in either a charged-particle-beam (CPB) microlithography apparatus or an optical microlithography

apparatus. In other words, as various lithographic procedures are performed on the substrate, the same alignment marks can be used without sacrificing accuracy.

Please amend the paragraph beginning on page 10, line 4, as follows:

Generally, the resolution limit of an FIA optical system is a function of the wavelength λ of the alignment-detection light source and the numerical aperture NA of the FIA optical system. The relationship is expressed as follows:

$$\text{Resolution limit} = \lambda/\text{NA}$$

For example, if the wavelength of the FIA light source is $\lambda = 550$ nm (approximately the median wavelength of white light), and the NA of the FIA optical system is 0.3, then the resolution limit is approximately 1.83 μm. Accordingly, on the substrate, if the width of the alignment-mark girders is 1.83 μm or less, then the alignment-mark girders will not be resolved by the FIA optical system. Hence, the corresponding alignment mark on the substrate provides an alignment-detection accuracy that is essentially the same as the accuracy obtained using the alignment mark 10 of FIG. 10(A), in which the alignment-mark elements are not split.

Please amend the paragraph beginning on page 19, line 1, as follows:

As described above, alignment-mark patterns defined in a stencil reticle can be transferred to a lithographic substrate using a CPB microlithography apparatus. The alignment marks thus formed on the substrate can be detected using ~~either~~ an alignment-detection device in a CPB microlithography apparatus and also can be detected using an alignment-detection-device (e.g., FIA-based) in an optical microlithography apparatus. Thus, position detection of the substrate can be accomplished with high accuracy in either type of microlithography apparatus.